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# annual flowers

for Canadian gardens

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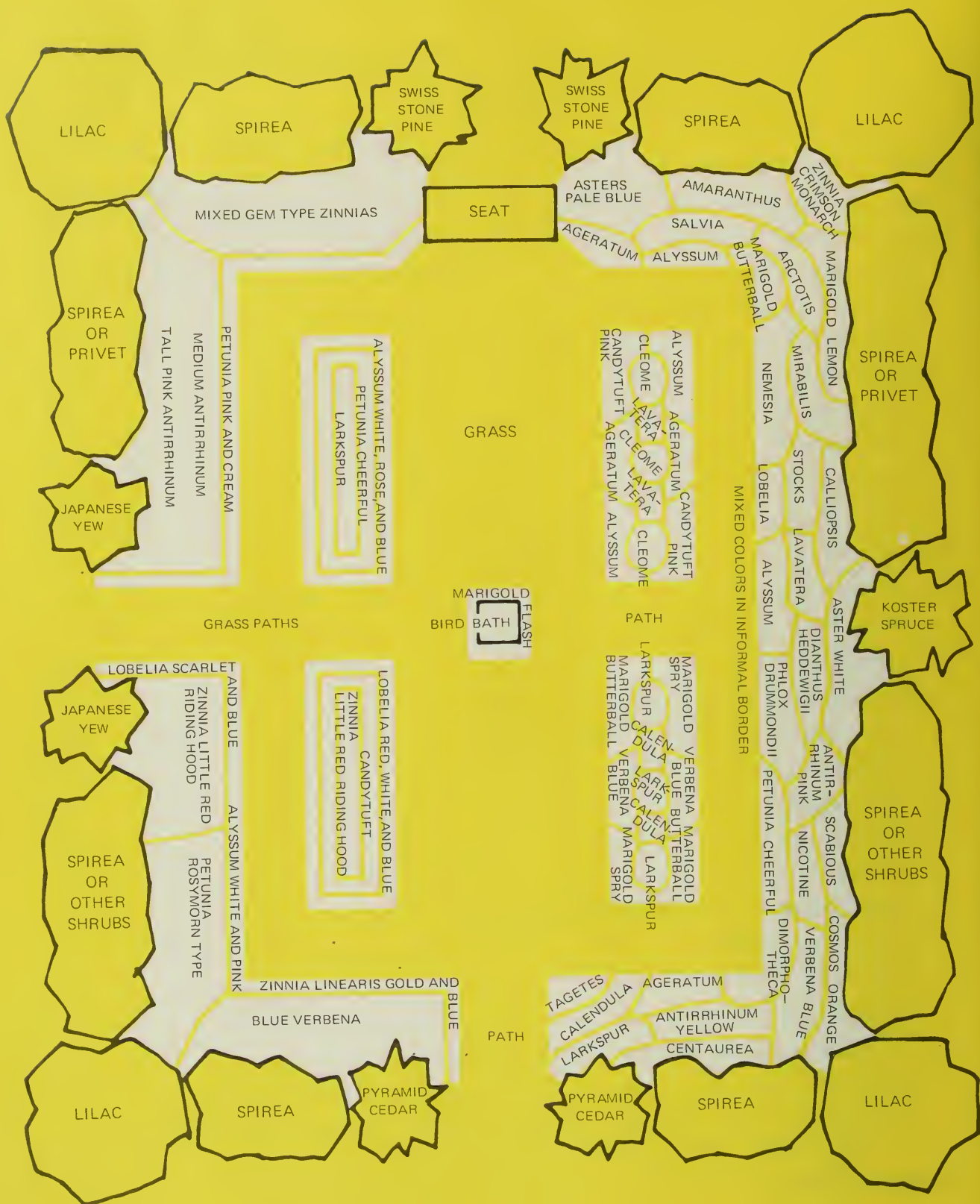
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## CONTENTS

	PAGE
Uses of annual flowers.....	3
Plans for arrangement of annuals.....	4
Seed and seed sowing.....	4
Dates of sowing.....	4
Sowing in pots and flats.....	6
Temperature for germination.....	8
Transplanting and cultivation.....	8
Pricking off the seedlings.....	8
Preparing the bed.....	9
Setting out the plants.....	9
Cultivation.....	9
Saving seed.....	9
Insects and diseases.....	10
Descriptions of annuals.....	10
Ornamental grasses.....	24
Annuals for special purposes.....	25
For colorful beds and borders of solid color.....	25
Climbers.....	26
Cut flowers.....	26
Fragrance.....	27
Foliage.....	27
Everlasting flowers for winter bouquets.....	27
For rock gardens.....	27
For window boxes.....	27
Hedges.....	27
Annuals that will flower in partial shade.....	27
Annuals especially adapted to hot sandy soil and full sunshine.....	28
Annuals that do well in sand when they receive enough moisture, but prefer heavier soil and less direct sun.....	28
Common and botanical names, and sowing classes of annuals.....	29





PLANS FOR ARRANGEMENT OF ANNUALS

# Annual Flowers

for Canadian gardens

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## USES OF ANNUAL FLOWERS

Annual flowers have many uses. They improve the appearance of even the smallest garden. On the grounds of new homes they provide color and interest before the permanent plantings of trees and shrubs take shape. They also solve the problem of what to grow in the gardens of rented homes where tenants do not wish to spend money for more permanent plants. Even where the soil is sandy and poor, a few inexpensive packets of seed of alyssum, calendulas, marigolds, phlox and zinnias will provide attractive color in the garden and plenty of cut flowers for indoors during the summer.

Annual flowers are also very useful in perennial borders. In summer and autumn, even well-planned borders have bare spots from which earlier-flowering plants have disappeared. For example, daffodils and tulips, which add so much beauty to the spring garden, leave large vacant spaces when their foliage dies. Annuals can be transplanted to fill these spaces nicely if you select colors that will not clash with the surrounding perennials in bloom at the same time.

When planting a new shrubbery, leave sufficient room between shrubs for them to develop, and plant annuals in these spaces for a few years. Annual flowers may also be planted in front of the shrubs to provide color after the shrubs finish flowering.

Annuals are excellent for cut flowers as they continue to bloom if the flowers are cut before they go to seed. The best way to grow flowers for cutting is in rows in the vegetable garden, or between it and the lawn. A "cutting garden" provides you and your friends with flowers without spoiling main border displays. If a cutting garden is not possible, plant good cutting flowers in the display part of the garden.

If space is available, a special garden for annual flowers may be made by creating beds of various shapes and sizes to fit the area. You should plan this carefully to scale on paper.

Before deciding what kinds of annuals to grow, consult the lists beginning on page 25. Also, remember that annual flowers like sun and very few will bloom satisfactorily in a shaded location. Seed catalogues will help you in choosing varieties of the desired height and color.

Annual plants complete their cycle of growth in one year but most perennials continue to grow year after year. Some tender perennials, such as petunia and snapdragon, bloom the first summer from seed sown in the spring. In our climate these do not naturally complete their cycle as perennials because they are killed by frost. For this reason they are grown as annuals and so are included in this publication.

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<sup>1</sup> Retired, 1962.



## PLANS FOR ARRANGEMENT OF ANNUALS

The plan on page 2 is not intended to be a complete plan for one garden. The positions of the beds and the surrounding shrubbery and evergreens would be satisfactory but, in a formal garden like this, the flowers should be arranged with some symmetry. For example, if marigolds and verbena were used in a bed on the right-hand side, the same plants (or ones of similar color and habit) should be used on the left. If the long border on one side is of mixed colors, and has an informal arrangement, the border on the other side should match it. Carrying out all the combinations shown on the plan in one garden would be a great mistake.

The plan gives several arrangements for individual beds and sections of the long left-hand borders. You may choose the combinations of flowers most suitable for particular beds.

A symmetrical garden such as this would be out of place with many of the modern homes. With these it is more appropriate to use color in bolder, angular patterns or blocks arranged without symmetry.

Most home owners want a flower border simply to give color in the garden and cut flowers for the house. Such a border may be arranged according to the plan on page 5.

## SEED AND SEED SOWING

Annuals are grown from seed each year. The first step is to obtain good seed from a reliable dealer. Seed collected in a garden where several varieties of the same plant, such as zinnia, are grown near one another will not produce plants true to type.

### Dates of Sowing

Annuals, and perennials grown as annuals, may be divided into four groups according to the length of time it takes plants to bloom after seed sowing. The following dates of sowing are arranged so as to have plants in bloom about the middle of July at Ottawa. In milder or more severe climates the date of sowing will be advanced or retarded but the numbers of days remain fairly constant.

- (a) Those requiring only 60 to 70 days from seed to bloom. Sow these in a cold frame about May 1, or in the open ground between May 10 and 15.
- (b) Those requiring 80 to 90 days. These may be sown indoors or in a hotbed between April 15 and 20.
- (c) Those requiring 90 to 100 days. Sow these indoors or in a hotbed about April 1. If a greenhouse is available, March 20 would be advisable.
- (d) Those requiring 110 days or more. Sow in a greenhouse only, between February 20 and March 1.

In the list of common and botanical names at the back of this publication, all plants are marked by the letter of the group to which they belong for seed sowing.

The hazards of raising plants in the open garden are greater than raising them indoors, though less labor is involved. Most annuals are started indoors. If a greenhouse or conservatory, or a bright sunroom, is not available, a cabinet



- A: Plant row 1 well out from the green background; row 2, 18 inches from row 1.
- Yellow: Marigold—Climax Yellow, Zinnia—Sunny Boy.
- Blue: Larkspur, Scabiosa, Verbena—Annapolis Blue.
- White: Nicotiana, Zinnia—Ice Cream.
- Red: Celosia—Molten Fire, Zinnia—Floradale Scarlet.
- B: Plant row 3, 12 inches from row 2; row 4, 12 inches from row 3.
- Blue: Ageratum—Blue Bedder, Centaurea—Blue Gem, Petunia—Blue Velvet.
- White: Stocks—Princess Alice, Phlox—Isabellina, Dimorphotheca—Glistening White.
- Rose: Phlox—Glamour, Petunia—Coral Satin, Zinnia—Pink Gem.
- C: Plant row 5, 12 inches from row 4; and row 6, 8 inches from row 5 and 8 inches from edge of grass.
- White: Lobularia (Alyssum)—Carpet of Snow, Petunia—Igloo.
- Rose: Verbena, Phlox drummondii, Petunia—Bonfire or Pink Satin.
- Blue: Ageratum—Blue Mink, Lobelia—Mrs. Clibran.
- Yellow: Marigold—Lemon Drops or Petite Yellow.

can be built in the basement with ample light provided by fluorescent lighting fixtures. Plants can also be grown early in covered hotbeds or cold frames outdoors.

Sowing the seed too early is the most common mistake made in handling annuals. The above dates are useful as a guide. Note that, unless a greenhouse is available, the earliest date recommended for indoor planting at Ottawa is April 1. Seed sown indoors before this usually produces spindly plants. These are susceptible to a fungus disease known as damping-off. The average gardener who wants to grow plants that come within groups *c* and *d*, above, is wiser to buy them on the market and transplant them rather than attempt to grow them from seed himself.

Seeds of many annuals can be sown directly into the garden about May 10 at Ottawa, and earlier in milder districts. Scatter such seeds thinly over the surface of a well-prepared bed and cover lightly with sifted soil. Sprinkle with a fine spray each day until the young plants are large enough to thin out, first to an inch or so apart and later to the proper distance for mature plants. This distance varies with species.

### Sowing in Pots and Flats

A good soil mixture is necessary when seeds are to be sown indoors in pots or in shallow boxes called flats (Figure 1). Two parts of loam, one of peat moss and one of sand will provide good drainage and yet hold plenty of moisture.

To avoid the disease called damping-off, the soil should be sterilized. The methods that have been used for some time are: (1) Pass boiling water or steam through the earth until the temperature rises to 180° F. and keep the soil at this

FIGURE 1 — Equipment for seed sowing. 1 Seed pan. 2 Tampers. 3 Flat filled with earth. 4 Bits of broken pot. 5 Sieve. 6 Dibble. 7 Labels.







FIGURE 2 — Sowing seeds in pot. Note sterilized soil in background and round tamper at left.

temperature for half an hour. (2) Sprinkle a bushel of soil with a quart of water containing  $2\frac{1}{2}$  tablespoons of formaldehyde and cover it with a sheet of plastic overnight. In either case, the earth cannot be used for a few days.

The easier and more modern method is to use a commercial preparation for soil sterilizing according to the manufacturer's directions.

After sterilizing, mix and air the soil thoroughly before filling the pots or flats. Place a few stones or pieces of broken pot in the bottom of each pot for drainage. Fill the pots or flats to within an inch of the top with the coarse soil mixture and add sifted soil until it is level with the top. Use a can or round tamper to press the earth smooth and level to about  $\frac{1}{2}$  inch below the rim of the pot. Some gardeners prefer to use sand or shredded sphagnum moss for this final layer in which the seed is sown.

Place the pots in a shallow tray of water and allow to stand until the moisture soaks to the top. Flats should be watered thoroughly with a fine spray from a can. Set them aside to drain and then they will be ready for the seed.

Scatter the seed thinly over the surface (Figure 2) or, in the flats, sow in rows. Press very fine seed lightly into the surface; it needs no soil cover. The depth of soil needed to cover other seed varies with the size of the seed. Twice the diameter of the seed is generally considered the best depth. Use finely sifted soil or shredded moss to cover seed. After sowing, cover the pots with a pane of glass and lay a sheet of paper over the glass to keep out the sun. As soon as the seeds begin to germinate, remove the paper.

Great care is needed in watering seeded pots and flats. Instead of watering the surface of the soil, stand the pots and flats in shallow trays and let the water soak up from below.

## Temperature for Germination

Seeds of most annuals germinate readily at any temperature between 50° and 80° F. The following preferences have been noted.

These require warm temperature, 70° to 80° F.:

Cleome	Nierembergia
Cobaea	Petunia

These prefer cool temperatures, 45° to 50° F.:

Arctotis	Godetia
Candytuft	Gypsophila
Centaurea	Larkspur
Clarkia	Nemesia

Seeds of phlox, salvia and verbena germinate irregularly. A few seeds will germinate and the rest may lie dormant for three or four weeks. To speed germination, place the seeded pots or flats alternately in a warm room (80° F.) and a cool one (50°), for two-day periods until germination is complete.

## TRANSPLANTING AND CULTIVATION

### Pricking off the Seedlings

When the seedlings are large enough to handle, prick them off into flats (Figure 3). Space the plants 2 to 3 inches apart, according to the size to which they are to grow before being transplanted to the garden.

Water the filled flats and place them in the greenhouse or hotbed. They should be shaded from sunlight for a few days to give the young plants a chance to establish their roots.

FIGURE 3 – Pricking off seedlings. Note wooden label being used to pack earth around seedlings.





As the weather becomes warmer, transfer the flats from greenhouse or hot-bed to the cold frames in order to harden the plants. Remove the glass sash from the frames for progressively longer periods on warm days. After the middle of May it should be put on the frames only when there is danger of a cold night. Gradual lengthening of the time the plants are exposed to natural conditions will ease the shock when they are set out in the garden during the last week of May or first of June. Plants moved directly from the heat of a greenhouse to the garden are soft and are likely to wilt when set out.

### **Preparing the Bed**

Although annual flowering plants do not need very rich soil, the ground needs to be well supplied with available plant food and, though well drained, should be able to retain moisture.

In preparing the soil, well-rotted manure is the best material to use. As this is seldom obtainable, many gardeners use granulated peat moss to add humus to the soil and commercial fertilizers to supply the extra plant food required. A good, complete fertilizer has the formula 5-10-15. That means 5 per cent nitrogen, 10 per cent phosphoric acid and 15 per cent potash. Four pounds per 100 square feet of bed should be scattered over the ground and dug in a few days before planting time. Few annuals do well in acid soil so lime should be added when necessary.

In new flower beds, remove the subsoil and all bits of bricks, stones and other rubbish and replace these with loam.

### **Setting out the Plants**

Transplant the seedlings on a dull, cloudy day when the ground is fairly moist. If the soil is very dry, water it; and shade the plants from the hot sun for a few days with paper. The distance apart to set the plants depends on the kind. For example, sweet alyssum plants should be 6 inches apart but giant zinnias need 18 inches for full development.

### **Cultivation**

When the plants are small the weeds can be kept under control by hoeing and, if thoroughly controlled during the first few weeks, they will not be troublesome later. When hoeing is not possible the beds should be weeded by hand. In very dry weather, water the plants. A thorough soaking of the roots once a week is better than a sprinkling every day. To keep the plants blooming for a long time, the flowers should be cut off when they fade. If they are left to form seed pods, the growth of young buds is checked and no further flowers will develop.

## **SAVING SEED**

It is not advisable to save seeds of plants where several varieties of the same species are growing in one garden; plants from these seeds will not be true to type. However, if a particularly good plant appears, it is often interesting to save the seed and see what plants result from it next year.

If you want to do this, choose a strong healthy plant and allow some of the flowers to set seed and grow to maturity. When the seed pods are full-grown and begin to change color, gather them and spread them out to dry in a cool, airy place; or cover the seed heads with a muslin bag and allow them to ripen on the plant. When they are thoroughly ripe and dry, clean the seeds and store them in cans or paper bags.



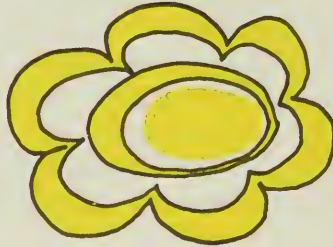
## INSECTS AND DISEASES

Cutworms often destroy young plants soon after they are set out by chewing them off at, or just above, ground level. Aphids and other sucking insects suck juices from leaves and stems. Other insects bite holes in the foliage and eat the leaves.

Some annuals, such as zinnias, are very susceptible to leaf-spotting diseases and powdery mildew.

For the average gardener, the modern combination sprays that control both insects and fungi are the most satisfactory chemicals to use. Several of these can be bought at local garden stores.

For information on the identification and control of insects and diseases ask your provincial entomologist, horticulturist, or agricultural representative.



## DESCRIPTIONS OF ANNUALS

The botanical names of the plants are given as in *Hortus Second* by L. H. Bailey and Zoe Bailey. Where these names are unfamiliar, the better-known botanical name is given also, for example, "*Alyssum*. See *Lobularia*." The common name of each plant is also given, except in cases where none is commonly used.

Few horticultural varieties (cultivars) are listed in this section, as new ones are introduced so often that a list is soon out of date. However, some excellent varieties for flower beds and borders appear in the 1960 list on page 25. Varieties available are described in seed catalogues.

The more popular plants are marked "\*".

***Adlumia fungosa*** (*A. cirrhosa*). Mountain Fringe, Allegheny Vine. A biennial, but easily raised from seed sown in spring. The leaves are fern-like and quite attractive. The flowers are white or purplish and resemble those of bleeding heart in shape. Does well in a cool, damp, shady place and will climb over fences.

\****Ageratum houstonianum*** (*A. mexicanum*). Flossflower. Neat-growing plant useful for edging beds and borders. The flowers are borne in large clusters and are lavender blue. The shade varies in different varieties. Height, 4 to 8 inches.

\****Althaea rosea***. Hollyhock. The annual hollyhock resembles the well-known biennial plant but since it blooms a little later and continues blooming until frost, it can be used to continue the blooming season of the bed after the biennials are finished. Height, 5 to 6 feet.

***Alonsoa caulialata***. Maskflower. A little-used, low bushy plant with small, irregular, two-lipped scarlet flowers. Is not very showy but is unusual and suitable for informal gardens.

\****Alyssum maritimum***. See *Lobularia maritima*.

\***Amaranthus**. These plants are grown for their red or purplish foliage, which is very effective in beds.

**A. caudatus**. Love-lies-bleeding. Has large coarse foliage with small, reddish-purple flowers arranged in drooping, rope-like panicles. Height, 3 to 5 feet.

**A. hybridus** var. *hypocondriacus*. Prince's-feather. The panicles of reddish or reddish-brown flowers are erect. The foliage is red. Height, 2 to 3 feet.

**A. tricolor**. Under this species are listed:

var. *melancholicus* has maroon-colored foliage. Height,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  feet.

var. *salicifolius*. Fountain Plant. It has long drooping leaves changing from bronze-green to orange-red. Height, 2 to 3 feet.

var. Joseph's Coat is similar to *salicifolius*. Height, 1 to 2 feet.

var. Molten Fire is the commonest variety now grown. It has large red-purple leaves. Height, 2 to  $2\frac{1}{2}$  feet.

**Ambrosia mexicana**. See *Chenopodium botrys*.

**Ammobium**. Useful only as an everlasting for winter bouquets as the plant is rather gaunt and unattractive.

**Anagallis**. An unusual, charming plant that makes an attractive edge of bright blue in a warm sunny border or in the rock garden. Height, 4 to 6 inches.

**Anchusa capensis**. Alkanet, Bugloss. A biennial that will bloom the first year if seed is sown indoors in April. The rich-blue flowers are very attractive. Height, 1 to  $1\frac{1}{2}$  feet.

\***Antirrhinum**. Snapdragon. Although not true annuals, these plants are always treated as such in Canada.

As rust has become so common, purchase only seed of rust-resistant varieties of snapdragons.

Start seeds early (class c) and pinch young plants once to make them branch out near the base. Varieties are grouped according to the heights of the plants and many varieties of beautiful colors are available in each group.

	Height
Tall .....	$2\frac{1}{2}$ to 3 feet
Intermediate .....	1 to 2 feet
Bedding .....	6 to 15 inches
Rock garden hybrids .....	3 to 6 inches

Tetraploid, which have larger individual flowers, and double-flowered varieties have recently been introduced. The group known as Rocket, introduced in 1960, proved superior to other tall varieties in our garden.

**Arctotis stoechadifolia** var. *grandis*. Blue-eyed African Daisy. The grayish-green foliage is an attractive setting for the blue-washed, white daisies. The centers are blue. Height, 15 to 18 inches.

**Artemisia sacrorum viridis**. Summer Fir. This plant resembles a small fir tree and is useful for the back of a border or for a small hedge. Height, 3 to 6 feet.

**Asperula orientalis** (*A. azurea-setosa*). Blue Woodruff. The foliage is finely cut and the pale-blue flowers are arranged in small clusters. A dainty plant with a faint fragrance. Height, 1 foot.



\***Aster**. See *Callistephus chinensis*.

\***Balsam**. See *Impatiens balsamina*.

**Bartonia aurea**. See *Mentzelia lindleyi*.

**Brachycome iberidifolia**. Swan River Daisy. A neat plant with quantities of blue daisies, about  $1\frac{1}{2}$  inches across. There are varieties with mauve and white flowers, also. Height, 1 foot.

\***Browallia americana** (*B. elata*). A compact plant with dark-green, glossy leaves and rich-blue flowers. Height, 1 to  $1\frac{1}{2}$  feet.

\***Calendula officinalis**. Pot Marigold. This has long been a favorite flower in gardens. It is very hardy and self-sows freely. There are a number of improved forms which are more attractive than the old-fashioned kind. If the flowers are cut before setting seed the blooming season will continue until severe frost. Height, 1 to 2 feet.

\***Calliopsis**. See *Coreopsis*.

\***Callistephus chinensis**. China Aster. A very popular annual and where it grows well there is no doubt it is one of the best. As it is subject to several diseases, some of which live over in the soil, it is not advisable to grow asters in the same soil for two years in succession. Unhealthy plants should be dug up and burned as soon as seen. Wilt-resistant seed should be bought when possible. There are two distinct types of aster plants, branching and upright. The latter are more compact and are useful for edging or beds but some of them have stems too short for cut-flower arrangements. The branching varieties have long stems and grow into large plants if planted  $1\frac{1}{2}$  feet apart. There are many different classes according to height, habit and season of bloom.

**Campanula**. Bellflower. Most species of *Campanula* are perennials but two annual ones, both suitable in rock gardens, are used.

**C. macrostyla**. This has open, bell-shaped, purple flowers, 2 inches across with a conspicuous, protuding stigma. Height, 12 to 18 inches.

**C. ramosissima** (*C. loreyi*). This has much smaller flowers than *macrostyla*. It is dainty and attractive. Height, 12 inches.

**Celosia argentea** var. *cristata*. Cockscomb. The common name describes the shape of the flowers, which are rich maroon in color. Height, 1 to  $1\frac{1}{2}$  feet.

\***C. argentea** var. *plumosa*. This plant is much more attractive than *cristata* as the flowers are arranged in plume-like heads. The colors are very rich and include lemon, gold and various shades of red. Height, 1 to  $1\frac{1}{2}$  feet.

**C. argentea** var. *childsii*. Chinese Woolflower. In this variety the heads are round instead of pointed but are similar to *plumosa* in color.

\***Centaurea cineraria**. Dusty Miller. Grown for its grayish foliage. It is really a tender perennial but plants for bedding purposes are often grown from seed each year. Height, 1 foot.

\***C. cyanus**. Cornflower, Bachelor's-button. One of the easiest annuals to grow from seed sown outdoors. If allowed to do so, it will self-sow and plants will come up year after year. The blue varieties are the most attractive but others in pink and white are also available. All are useful for cutting. Height, 1 to 3 feet.

**C. gymnocarpa**. Dusty Miller. Another perennial which, in the seeding stage, is used as a foliage plant. The leaves are grayer and more deeply cut than those of *C. cineraria*.



***C. moschata*.** Sweet Sultan. A half-hardy annual the seed of which should be started indoors. The fragrant flowers resemble thistles but there are no prickles on the stems. There are white, mauve and yellow flowering varieties. Height, 2 feet.

***Cheiranthus allionii*.** See *Erysimum asperum*.

***Chenopodium botrys*.** Ambrosia. The green flowers are quite small and clustered along the stems. They have a spicy scent that is popular with many people. Height, 1 to 2 feet.

***Chrysanthemum*.** Annual chrysanthemums are not much like the fall-blooming plants generally known as chrysanthemums but they are quite attractive. Like many composite flowers they are beloved by the tarnished plant bug. This small insect sucks the juice out of the young buds and destroys the symmetry of the flowers. Where the insect is not numerous, or can be controlled, chrysanthemums should be grown in quantity both for their showiness in the garden and for cut flowers.

***C. carinatum* and *C. coronarium*** are the species from which these annual chrysanthemums are derived. The ray florets are various shades of primrose and yellow, more or less marked with brown. The center florets vary in color, some matching the rays while others are brown in contrast to them. Height, 2 to 3 feet.

***C. parthenium*.** Feverfew. This plant is grown for its yellowish-green foliage, which is used for edging beds and borders as well as for carpet bedding. Seedsmen sell several varieties that vary in size and compactness. If grown for the foliage the buds should be pinched out. The white, daisy-like flowers are attractive but spoil the neat effect that the foliage alone gives. Height, 6 to 12 inches.

***C. segetum*.** Corn Marigold. This species is a weed in European grain fields but the variety *grandiflorum* has large yellow daisies that are excellent for cut flowers. Height, 2 feet.

**\**Clarkia elegans*.** Clarkia. The garden varieties have attractive long sprays of flowers in various shades of rose as well as white and red. There are both single and double forms. Easily grown from seed sown in the bed where they are to flower. Height when planted close together is 2 to 2½ feet.

***C. pulchella*.** A smaller-growing plant that has narrower leaves and slightly broader petals than *elegans* but is not so showy. Height, 1 to 1½ feet.

**\**Cleome spinosa*.** Spiderflower. An unusual-looking plant that has long spikes of pink and white flowers with very long stamens. It is rather coarse and needs room to develop. Height, 4 feet.

***Cobaea scandens*.** Cup-and-saucer Vine. Although a tender perennial, this plant grows rapidly from seed. It has clean attractive foliage and is useful for growing in front of verandas or over archways. The bell-shaped flowers are violet. Height, 20 feet.

***Convolvulus*.** See *Ipomoea*.

**\**Coreopsis*.** Tickseed. There are several species of this plant, all easily grown from seed sown where it is to flower. The blooms are attractive in the garden and useful for cutting.

***C. drummondii*.** This variety has bright-yellow ray florets with purple-brown disks. Height, 2 feet.

***C. stillmanii* (*Leptosyne stillmanii*).** The bright-yellow flowers are small but are borne in great profusion. It is useful for the rock garden. Height, 1 foot.

***C. tinctoria*** (*Calliopsis marmorata*). There are several forms of this variety that have finely cut foliage and bloom well if the seed pods are removed. The flowers have pointed ray florets and are yellow with markings and spots of brown. Height, 8 to 15 inches.

**\*Cosmos.** The fine-cut, dark-green foliage and the branching habit of growth make this a useful plant for hedges. The flowers are also attractive. When buying cosmos seeds obtain early-flowering varieties as some kinds need such a long season of growth that they do not bloom in Canadian gardens. The flowers are useful for cutting and the plants bloom until severe frost. Seeds of named varieties that come true to color are available in various shades of rose as well as white. Height, 3 to 5 feet.

The varieties Orange Flare and Burpee's Yellow are more dwarf and have beautiful flowers that are very useful for cutting. Height, 3 feet.

***Cucurbita pepo*** var. *ovifera*. Yellow-flowered Gourds. These are really trailing plants but the vines are trained on supports so that the fruits will grow to perfection and be seen. A strong trellis or arbor is required as the plants are heavy when loaded with fruit. Their habits of growth are similar to pumpkins and squash. The seeds can be sown outdoors as soon as the ground is warm, but in districts where the season is short it is better to start them in pots indoors. The fruits, which resemble apples, pears, eggs, and oranges, are not edible but are grown for appearance only. After they are well ripened and thoroughly dry the hard skins are varnished or waxed and used for ornaments.

***Cuphea platycentra*** (*C. ignea*). Cigar Flower. The showy narrow red tube with a white mouth edged with black is really the calyx and the corolla is inconspicuous. Height, 1 foot.

***Dahlia*.** Named varieties of dahlias have to be propagated from tubers but seeds of the various types can be bought and seedlings come fairly true to type though they vary in color. The early-flowering dwarf types known as Coltness Gem and Unwin Dwarf hybrids make satisfactory bedding plants and are the best to grow from seed. Seedlings should be pricked off into separate small pots. Another shift into larger pots is required later. The plants must be carefully hardened off before being set into permanent quarters in June or whenever the danger of frost is over. The tubers may be dug up and stored in a frost-proof cellar. Height, 2 to 3 feet.

**\*Delphinium.** Larkspur. The annual delphiniums are not as well known as the perennial form but they are equally beautiful and useful in the garden and for cut flowers.

***D. ajacis***, Rocket Larkspur and ***D. consolida***, Stock-flowered Larkspur are the two species from which the horticultural varieties have been derived. There are various strains which vary in height and in size of flower. The colors in both types are very beautiful and include white, pink, rose, red and light and dark purple. Height, 2 to 4 feet.

***D. grandiflorum*.** Bouquet Larkspur. This is often listed as *D. chinense* in catalogues. Although it is a perennial it blooms within a few weeks after the seed is sown. The foliage is fine-cut and the plant has a branching habit. The blue color of the flowers is very fine. There is a white variety also. Height, 15 inches.

**\*Dianthus.** Pink. Most plants of this genus are perennials, valuable in the border and rock garden, but there are also some fine annual species.

***D. chinensis*.** Indian Pink, Chinese Pink. This species and its variety *heddewigii* are very showy and easy to grow. They are useful for cutting but have no perfume. The flowers are large and some are single and others double. There is a great variety in color: white, pale pink, rose, red, and mixtures of these colors. Height, 8 to 12 inches.



***Dianthus*** sp. Sweet Wivelsfield. A hybrid very similar to the biennial sweet william, and to the annual sweet william listed by some firms. Height, 1 to 1½ feet.

***Didiscus***. See *Trachymene*.

\****Dimorphotheca aurantiaca***. Cape Marigold. Daisy-like flowers in beautiful shades of cream, lemon and orange. They grow quickly from seed and, in a sunny spot, bloom all summer. The plants spread and one row will make a strip about 2 feet wide covered with bloom. Height, 1 to 1½ feet.

***Dolichos lablab***. Hyacinth Bean. An interesting climber with rosy-purple, pea-shaped flowers followed by deep purplish-red seed pods. Height, 10 feet.

***Echinocystis lobata***. Wild Cucumber. Another useful climber which will clamber over shrubs, fences and rubbish piles if allowed to do so. It is indigenous to many parts of Canada and its long sprays of creamy-white flowers are often seen in the hedgerows. It will grow 15 or more feet and will transform the appearance of an old shed or fence. The seed should be sown where it is to grow. Seedlings spring up from self-sown seed but are easily destroyed.

***Echium plantagineum***. Viper's Bugloss. A near relation to blue-weed, which is sometimes seen in quantities in the fields. The annual species is easy to grow and the plants are covered with lilac-blue flowers all summer. Height, 2 feet.

***Erysimum asperum*** (*Cheiranthus allionii*). Siberian Wallflower. A biennial that will bloom in summer from seed started indoors in spring. When once established in the garden it self-sows freely and the young seedlings live over winter and bloom early in summer. The flowers are brilliant orange-yellow and are very showy and attractive. Height, 1 to 2 feet.

\****Eschscholzia californica***. California Poppy. A perennial that is grown as an annual in Canada. The seed should be sown where the plants are to bloom. They are very showy and attractive with their fine-cut, grayish-green foliage and brilliant-orange flowers. There are varieties with cream, primrose and pink blooms and some with double flowers, but the rich orange of the species is as attractive as any. The variety called Miniature Primrose, with small flowers on stems a few inches high, is useful for the rock garden.

***Euphorbia***. Mexican Fire Plant. Has showy red and green foliage in late August and September. Snow-on-the-mountain has variegated silver leaves. These tall plants are chiefly useful for their foliage; the flowers are too small to make any effect.

\****Gaillardia pulchella*** var. *picta*. Annual Gaillardia. The perennial species is the well-known Blanket Flower. Some of the annual ones are very similar and have single flowers of yellow with brownish-red markings; others have tubular florets, purplish-red with yellow tips. All of them are easy to grow and will bloom all summer if started early. Height, 1 to 2 feet.

***Gilia lutea***. This is listed by seedsmen as *Leptosiphon roseus* and *L. hybridus*. Attractive dwarf plant with finely cut foliage and small, star-shaped flowers in red, pink, yellow and cream. Suitable for the rock garden. Height, 3 to 6 inches.

\****Godetia amoena*** and ***G. grandiflora***. It is from these two species that the garden forms have been derived. They do best in light soil in a sunny position. There are several types; tall ones with flowers in long loose sprays of single or double flowers, and compact-growing varieties that make neat bushes of flowers. The colors are various shades of pink, and the texture of the petals reminds one of silk. Height, 1 to 2½ feet.



***Gomphrena globosa*.** Globe Amaranth. A neat upright-growing plant with quantities of ball-shaped flowers that are useful for winter bouquets. They dry well and keep their color. The one with purple flowers is the best, but from a packet of mixed seed, white, pink, orange and yellow flowering varieties are obtained. Height, 1½ to 2 feet.

\****Gypsophila elegans*.** Annual Babies'-breath. The white flowers of the annual variety are larger than those of the well-known perennial species. Both are used in the same way when cut. Height, 1 to 2 feet.

\****Helianthus annuus*.** Sunflower. There are many varieties of annual sunflowers. Some are very tall and have large heads of yellow flowers; others are small and have brownish ray florets. All are easily raised from seed, which should be sown where the plants are to bloom. Most varieties are suitable only for the back of the border or for a screen. Birds are very fond of the seeds and it is interesting to watch the goldfinches busy feeding on them in the late summer. Height, 5 to 10 feet.

***H. debilis*.** Miniature Sunflower. This species is a smaller plant of bushy habit with quantities of small flowers that are very useful for cutting. Height, 2 to 3 feet.

\****Helichrysum bracteatum*.** Strawflower. These most popular everlasting flowers should be grown in an inconspicuous place as they should be cut in the bud stage for drying for winter bouquets. The cut blooms should be tied into small bunches and hung head down in an airy place until thoroughly dried. There are a number of beautiful colors in a good mixture, including white, orange, pink and maroon. They do best in good loamy soil. Height, 2 to 3 feet.

***Heliotropium*.** Heliotrope. Though a perennial, this plant will flower in summer if seed is sown indoors. The flowers are borne in clusters in various shades of violet and purple. The fragrance is well-known but the amount varies in different plants. Choice seedlings can be potted and kept indoors over winter, and cuttings can be rooted to obtain beds or borders of plants that are uniform in color, fragrance and height. Height, 1 to 2 feet.

***Helipterum manglesii*.** Rodanthe. An attractive everlasting flower with drooping, daisy-like flowers in pink and white. They bloom early from seed and must be gathered before fully open. Height, 1 to 1½ feet.

***H. roseum*.** Acroclinium. An attractive plant in the garden. Its pink flowers remind one of an English daisy that has grown larger than usual. The flowers should be gathered when half open, and dried if required for winter bouquets. Height, 1 to 2 feet.

\****Iberis amara*** and ***I. umbellata*.** Candytuft. The annual candytufts are derived from these species but are sold under variety names. The seed should be sown in good soil rich in humus where the plants are to flower. They should be carefully thinned out to 8 or 10 inches apart. If the seed pods are kept cut off, the blooming season will be lengthened. For a continuous display, seeds should be sown at intervals during the summer. Height, 6 to 18 inches.

\****Impatiens balsamina*.** Garden Balsam. Erect plants with thick, transparent-looking stems around which the short-stemmed flowers grow out from the axils of the leaves. A tuft of bright-green leaves tops the stem. The individual flowers are very beautiful and in the modern varieties the leaves do not hide the flowers as they used to do in the older varieties. The double flowers are white, pink or red. Height, 1 to 2 feet.

***Ionopsidium acaule*.** Diamondflower. A dwarf, compact plant that covers itself with small, violet-colored flowers. It prefers some shade and moisture but will grow in crevices in flagged walks if not too dry. Height, 2 to 3 inches.

\****Ipomoea purpurea***. Common Morning Glory. This is one of the most useful annual climbers for covering a trellis or training up the side of a verandah. Seed is sold in mixtures and many beautiful colors are found among the seedlings. The seed coats are rather hard; soaking the seeds in warm water for 24 hours speeds germination.

***I. tricolor***. Heavenly Blue Morning Glory. The flowers are a wonderful color and are borne profusely from midsummer onwards if seed is started indoors in spring. It can be sown outdoors as soon as the soil warms up. The plant prefers light sandy soil and does not require any fertilizer. The variety Pearly Gates is similar except for the color, which is creamy white.

***Jacobaea***. See *Senecio*.

\****Kochia scoparia*** var. *trichophila*. Summer Cypress, Fire Bush, Belvedere. This plant is grown for its neat, bush-like habit. The flowers are inconspicuous. In spring and summer the plant is covered with narrow, light-green leaves which, with the stems, turn crimson in autumn. When once established it self-sows and young seedlings can be transplanted to suitable locations. It is an excellent plant for a hedge. Height, 2 feet.

***Lagenaria siceraria***. White-flowered Gourd. The plant from which the large-fruited gourds, dipper, Hercules club and calabash gourd, are obtained. They are similar in growth to *Cucurbita* and need the same treatment.

\****Lathyrus odoratus***. Sweet Pea. One of the most popular flowers for cutting as it is suitable for all occasions. It is best to grow sweet peas in rows in the cutting garden or in some place requiring a screen. They prefer cool moist soil and are hard to grow in full sunshine on light dry sand.

For best results prepare the ground in the fall by digging a trench 2 feet deep and 2 feet wide. Mix a thick layer of thoroughly rotted manure with the soil and turn the whole back into the trench, leaving the surface of the soil rough so that as much of it as possible is left exposed to winter weather. When manure is not obtainable, peat moss can be used. As sweet peas require slightly alkaline soil, add some lime if the soil is acid. In spring, as soon as the frost is out of the ground and the soil has dried, add a complete fertilizer, with the formula 5-10-15, at the rate of 5 pounds per 100 feet row. Open a trench 6 inches deep, set the seed about 3 inches apart and cover with 2 inches of soil. When the plants have grown 3 or 4 inches high thin them out to 6 inches apart. Fill the trench gradually as the plants grow. As sweet peas do better if they have some support when quite young, place twigs in position as soon as the plants begin to grow. The permanent supports can be made of brush, or chicken wire. The latter must be attached firmly to posts placed in the ground 6 to 10 feet apart.

For large exhibition blooms, allow only one or two stems to grow; tie each of them to a bamboo cane and cut off the tendrils and side shoots. Keep the ground well cultivated. In dry weather a thorough soaking with water is necessary about once a week. There are a great number of varieties and a wide selection of colors described in seed catalogues. The Spencer varieties are the ones with large waved petals. The old *grandiflora* varieties are seldom listed. Cupid sweet peas are dwarf-growing plants suitable for the front of a border. In hot soil, Cuthbertson and *multiflora* strains introduced recently are easier to grow than others.

\****Lavatera trimestris***. Annual Lavatera. The variety Loveliness is probably the best. The deep-pink flowers are large and borne in great profusion on bushy plants. The leaves are nearly round and deep green. A row of these plants makes a beautiful flowering hedge. Height, 2 to 3 feet.

***Leptosiphon***. See *Gilia*.



**Leptosyne.** See *Coreopsis*.

***Limonium bonduelli*** and ***L. sinuatum***. Statice. These species are very similar except in color; *bonduelli* has yellow flowers and *sinuatum* has blue, lavender or white ones. The long, branching sprays are attractive in the garden but are generally grown for winter bouquets as the flowers dry well and keep their color all winter. Height, 1 to 2 feet.

***L. suworowii***. The rose-pink flowers of this species are very small and clustered together on a long narrow spike. They dry well for winter use. Height, 1 foot.

***Linaria bipartita***. Fairy Bouquet is a strain useful for the rock garden. Height, 4 to 6 inches.

***Linaria maroccana***. Toadflax. An easily grown annual that makes neat, upright clumps covered with flowers that are borne in long sprays and resemble small snapdragon blooms with spurs. There are many colors, including pink, purple, yellow and pure white. Height, 1 foot.

***Linum grandiflorum*** var. *coccineum*. Scarlet Flax. The rich color of this annual makes it a general favorite. It grows easily from seed sown outdoors in spring and blooms all season. Height, about 1 foot.

***Lobelia erinus***. Lobelia. Most garden varieties belong to this species. Often difficult to start from seed. The neat plants covered with small blue flowers are most attractive for edging beds. The pinkish and white-flowered varieties are not as attractive. There are compact forms for edging, and spreading forms useful for window boxes. Height, 6 to 12 inches.

***L. tenuior***. A larger plant of upright habit with flowers at least double the size of the ordinary varieties. The blooms are blue, mauve or white. Height, 1 to 2 feet.

***Lobularia maritima*** (*Alyssum maritimum*). Sweet Alyssum. For edging beds and borders, no plant is easier to grow or gives a longer period of bloom than sweet alyssum. The compact forms such as Carpet of Snow are best. About August, when the flowers are going to seed, take a pair of shears and cut off the plants at 2 inches above the ground. In a week or so they will be covered with green and starting to bloom again. They will continue to flower until hard frost. After cutting back, the plants should be watered if the weather is dry. The variety Royal Carpet is very compact and a rich violet color which does not fade. Height, 6 inches. The new tetraploid variety called Snowbank is very coarse, but useful for covering space.

***Lupinus***. Lupine. The lupines generally seen in gardens are perennials but there are several annual species. The flowers are very similar but the plants do not grow as large. The *Hartwegii* varieties are the most popular for the annual flower border as they can be obtained in a number of beautiful colors, including blue, rose, red and purple and white. Height, 2 to 3 feet.

***Lychnis viscaria***. Generally called Viscaria in catalogues. This plant has been improved in recent years and there are several varieties that vary in height and habit as well as in color. The compact forms, which make neat, small upright plants, are useful for edging or may be used in the rock garden. The blue and pink ones are particularly attractive. Height, 8 to 12 inches.

\****Malcomia maritima***. Virginian Stock. This small-flowered plant makes a pretty border from early July until frost if the seed is sown in early May where the plants are to bloom. Height, 6 to 12 inches.



***Malope trifida*.** Malope. This member of the mallow family is easy to grow from seed sown outdoors. The rosy-purple flowers are produced in profusion. There is also a white variety. Height, 2 to 3 feet.

***Marigold*.** See *Tagetes*.

***Mathiola bicornis*.** Night-scented Stock. This plant is grown for the perfume of the flowers, which fills the air in the evening. The blooms are single and lilac-colored. As they remain closed all day they are not attractive, and should not be planted in a very conspicuous location. Height, 6 to 10 inches.

**\**Mathiola incana* var. *annua*.** Ten-weeks Stocks. In most parts of Canada, when growing stocks from seed outdoors, the early-flowering strains of stocks should be used; otherwise, some of the plants may not bloom during the season. A disappointing number of plants may have single flowers, instead of double ones, unless the darker-green, spindly seedlings are discarded. The doubles are usually more compact and lighter in color. The plants are sometimes attacked by disease and should not be grown in the same ground two years in succession. There are dwarf and tall varieties in white, rose, crimson and light and dark mauve. They have a pleasing fragrance. Height, 8 to 24 inches.

***Mentzelia lindleyi* (*Bartonia aurea*).** This is listed in catalogues as *Bartonia*. It has large, golden-yellow flowers which are very attractive. These plants do not transplant well but will flower in July if seed is sown where it is to grow. Height, 1 to 2 feet.

***Mirabilis jalapa*.** Four-o'clock, Marvel-of-Peru. The first common name of this plant refers to the habit of the flowers, which open in the afternoon and close in the morning. It is a tender perennial with tuberous roots but is generally treated as an annual. The neat bushes with shining green leaves are covered with flowers in late summer. The seed is generally sold in mixtures of pink, red, yellow and white varieties. The tubers may be dug and stored like dahlias in a frost-proof cellar for the winter. Height, 2 to 3 feet.

***Morning Glory*.** See *Ipomoea*.

***Molucella laevis*.** Bells of Ireland. Graceful stems with round leaves and chartreuse-green bracts surrounding small white flowers. Used in flower arrangements but of little value in the garden.

***Nasturtium*.** See *Tropaeolum*.

**\**Nemesia strumosa*.** A very showy annual of medium height. The large-flowered types are most attractive for general planting and the colors include orange, red, pink and white. The dwarf varieties Blue Gem and White Gem have quantities of small flowers on neat compact plants. Height, 8 to 15 inches.

***Nemophila menziesii*.** Baby Blue-eyes. This does well in a cool, moist location and has a low, compact, trailing habit of growth with quantities of small blue flowers. Some varieties are white with dark-blue eyes. Height, 3 to 12 inches.

**\**Nicotiana alata* var. *grandiflora* (*N. affinis*).** Nicotine. The flowers are white and very fragrant when they open in the evening. As the plants are untidy looking during the day when the flowers close, it is advisable to plant them at the back of the border where they are not so noticeable. Height, 2 to 3 feet.

***Nicotiana*.** Crimson Bedder. It is more dwarf than the white form. The flowers do not close up during the day and lack the fragrance of the white ones. Very useful for filling up gaps in a perennial border. Height, 1 to 2 feet.

***Nierembergia caerulea*.** Cupflower. A half-hardy perennial which is cultivated in Canada as an annual. The blue, cup-shaped flowers cover the plants with bloom. Height, 6 to 8 inches. Purple Robe is an improved variety.

***Nigella damascena*.** Love-in-a-mist. An unusual-looking plant with finely cut foliage, and blue flowers which are followed by ornamental seedpods. Height, 12 to 18 inches.

***Oenothera acaulis* (*O. taraxacifolia*).** Dandelion-leaved Sundrop. A prostrate plant with large white flowers which take on a rosy shade as they fade. It is really a biennial but blooms the first summer from seed. Height, 6 inches.

***O. drummondii*.** An annual species with large, pale-yellow flowers. Height, 1 foot.

***O. trichocalyx*.** A biennial which flowers the first year from seed started indoors. This grows more upright than other species, and has white fragrant flowers. Height, 1 foot.

**\**Papaver*.** Poppy. The seeds of poppies are very small and must be sown in fine soil and covered with a very thin layer of sifted soil. The seedlings do not transplant well so it is advisable to sow the seed either where it is to grow or in small pots.

***P. rhoeas*.** Corn Poppy. The common field poppy of Europe from which the well known Shirley poppies have been derived. There are many shades of pink as well as red and white. Some varieties have double flowers. If the seed pods are kept cut off, the plants will continue to flower over a long period. Height, 1 to 2 feet.

***P. somniferum*.** Opium Poppy. It is forbidden by law to grow this poppy in Canada though the importation of seed for cake decoration is permitted.

**\**Petunia hybrida*.** Petunia. Of all the flowers grown as annuals, the petunia is probably the most satisfactory. It does well in ordinary garden soil and prefers full sunlight. There are several types of petunias and each has many varieties. The large-flowering, frilled, ruffled and double varieties need more care than others. Any plant that seems to be worth keeping may be potted and taken indoors for the winter, and used in the spring to provide cuttings for more plants. When potting, the roots should be trimmed and the tops cut back for about half their length. For ordinary garden purposes the balcony and bedding types are the most effective. In recent years groups of new varieties known as F<sup>1</sup> and F<sup>2</sup> hybrids have become very popular. They are large, single-flowered plants in clear pinks and reds that make a bright show. Most catalogues list many varieties in various shades of blue, maroon, pink and purple. If a large space is to be filled the *grandiflora* type is usually best, but for neat borders the *multiflora* or dwarf bedding types are most suitable. Petunias can also be used satisfactorily for window boxes which get plenty of sunshine. Few plants will give such a continuous display of bloom.

***Phacelia campanularia*.** This is a pretty, blue-flowered, bell-shaped annual that blooms early from seed sown where it is to grow. Height, 8 to 12 inches.

**\**Phlox drummondii*.** Annual Phlox. This very attractive plant blooms freely over a long period. In good soil that does not dry out too much the plants will spread for a foot or more. There are a number of showy varieties named for the color of the bloom, including white, chamois, pink, light and dark red, mauve and purple.

***P. drummondii compacta*.** A dwarf, compact form, useful for edgings where space is limited. Height, 6 to 8 inches.



***Polygonum orientale*.** A variety of this, Sutton's Ruby Gem, has light-green leaves, and narrow spikes of small pink flowers borne well above the foliage. It may be used for a low hedge or for the back of a border. The plants bloom from the end of June until frost. Height, 3 to 4 feet.

***Portulaca grandiflora*.** Rose Moss. A light soil in a warm sunny position suits this plant to perfection. The seed should be scattered thinly over the soil and raked in. When once established it will self-sow every year. The plants spread over the ground and soon cover a wide area. There are many different colors among the seedlings and any that are disliked can easily be pulled out. The flowers close at night and do not open on dull days. The plants are generally killed by the first frost but the seeds live in the ground all winter and germinate in spring.

***Pyrethrum*.** See *Chrysanthemum*.

***Reseda odorata*.** Mignonette. This sweet-scented flower does not transplant well so the seed should be sown in the place where it is to grow. The spikes of brownish-green flowers are borne in great profusion and are very useful for cutting as well as for the sweet fragrance which is so noticeable in the garden on summer evenings. There are a number of varieties listed. Height, 1 to 2 feet.

***Ricinus communis*.** Castor-oil Plant. The plant is not very suitable for a private garden but the large, exotic-looking leaves make a fine show in the center of beds in parks. The color of the leaves varies, some being green, others purplish-red, according to the variety. Height, 4 to 6 feet.

***Rodanthe*.** See *Helipterum*.

***Rudbeckia bicolor*.** Annual Coneflower. This is a valuable plant in the garden and for cutting. The brown markings on the yellow ray florets are very effective. Height, 1 to 2 feet.

**\**Salpiglossis sinuata*.** From this species the beautiful, showy annuals of gardens have originated. The trumpet-shaped flowers are gorgeously colored. Gold, red and velvety purple with various stripes and marks are found among them. They make an excellent show in the garden and are useful for cutting. The foliage is rather scant so some more-leafy plant should be grown in front of them. In a place exposed to wind the plants should be staked to prevent the flowers from being knocked down onto the soil. There is a compact growing form with smaller flowers. Height, 1 to 3 feet.

**\**Salvia splendens*.** Scarlet Sage. Although a tender perennial, this plant will bloom in late June from seed sown indoors if an early-flowering variety like Blaze of Fire is used. The bright-scarlet flowers are particularly noticeable late in the season and continue to give a splash of color until severe frost. Height, 1 to 2 feet.

***Sanvitalia procumbens*.** The double-flowering form is a very useful plant for the rock garden. It makes mounds of green covered with small flowers that have yellow ray florets and brown disks and look like miniature sunflowers. Easily grown from seed sown outdoors. Height, 6 to 8 inches.

**\**Scabiosa atropurpurea*.** Sweet Scabious, Pincushion Flower. This is a good plant, both for the border and for cutting. The stems are strong and wiry and hold the rounded flower heads well above the foliage. They can be obtained



in lavender, blue, pink, rose, maroon and white. If the seed heads are kept cut off they will bloom until severe frost. Height,  $2\frac{1}{2}$  feet.

***Schizanthus***. Butterfly Flower. At Ottawa this plant does better in the greenhouse than outdoors. Probably the summers are too hot and dry for it. The pretty, fern-like foliage is attractive and the unevenly shaped flowers come in many combinations of colors. Height, 1 to 2 feet.

***Sedum caeruleum***. Blue Stonecrop. The small, fleshy leaves are typical of *Sedum* but the pretty, pale-blue flowers are unusual. It is a small spreading plant suitable for filling vacant spaces in the rock garden. Height, 2 to 3 inches.

***Senecio cineraria*** (*Cineraria maritima*). Dusty Miller. This is a plant grown for its foliage, which is almost white. Height, 1 to 2 feet.

***Senecio elegans*** (*Jacobaea elegans*). Purple Ragwort. The flower heads are not very large but several are borne in a cluster. They come in various shades of purple as well as white. The color of the purple flowers is unusual in annuals. Height, 1 to 2 feet.

***Silene armeria***. Sweet William Catchfly. This plant self-sows very freely and the young seedlings live over winter and come into bloom early in spring. If seed is sown outdoors early in May the flowers appear in June and continue until frost. The clusters of small star-shaped flowers are deep rose and show up well above the grayish-green foliage. Height, 1 to  $1\frac{1}{2}$  feet.

***Statice***. See *Limonium*.

\****Tagetes***. Marigold. There used to be three distinct groups of marigolds, African *T. erecta*, French *T. patula* and *T. signata* (now called *T. tenuifolia*) but in recent years the plant breeders have introduced so many new kinds that it is difficult to classify them into the old groups. There are now varieties ranging from a few inches in height, which form compact low borders, to bushes  $3\frac{1}{2}$  feet tall, suitable for the back of a border. Good descriptions are generally given in seed catalogues. Some flowers are much like single daisies; others are semidouble. The fully double forms are pompons, or carnation- or chrysanthemum-flowered. The colors are yellow through bronze to mahogany. The foliage of most is finely cut and dark green. Unfortunately the marigold has a strong unpleasant odor which renders the plants useless as cut flowers. They are, however, very useful for beds or borders.

***T. tenuifolia*** var. *pumila*. A very dwarf form with single yellow flowers. It is very useful for edging or for filling a blank space in the rock garden. Height, 6 to 8 inches.

***Trachymene caerulea*** (*Didiscus caerulea*). Blue Lace-flower. The pale-blue flowers are arranged in large clusters and are attractive in the garden as well as for indoor decoration. Height, 1 to 2 feet.

\****Tropaeolum majus***. Nasturtium. This is useful as well as ornamental. The leaves and buds may be used for seasoning and the seeds make excellent pickles. The showy flowers are well-known and are generally some shade of yellow, orange or brownish red. The climbing varieties will soon cover a fence or hedge, or sprawl over unsightly places. The seedlings do not transplant well so it is advisable to sow the seeds where they are to grow. The dwarf varieties are useful for edging and flower more profusely in poor soil than in a rich one. The Gleam strain with double flowers requires the same treatment. The original Golden Gleam was fragrant. Nasturtiums are sensitive to early fall frosts so it is advisable to cover them if an extra-cold night comes early in autumn. To control

black aphids, which are often very troublesome, nicotine sulphate should be sprayed on early in the season; once the lice become numerous they will soon destroy the plants.

***T. peregrinum*** (*T. canariense*). Canary-bird Flower. This is a useful vine with light-green leaves and bright-yellow flowers. They are quite different from nasturtiums but can be used for the same purposes as the climbing varieties.

***Ursinia***. Jewel-of-the-Veld. Several species of this are very similar. The flowers are richly colored, orange-yellow daisies with a dark band near the center. The foliage is finely cut and adds to the attractiveness of the plant. Height, 1 to 2 feet.

***Venidium fastuosum***. This is a coarse plant with large, vivid-colored flowers, the ray florets orange and the disks black. They flower better on rather poor soil. Height, 1 to 2 feet.

**\**Verbena hortensis***. Although a tender perennial, these plants flower in a few months from seed sown indoors. They have a spreading habit of growth and will fill a space 2 feet across in good soil in a sunny position and will bloom until severe frost. The sweet-scented flowers are borne in umbels. The colors are white, pink, scarlet, maroon, violet and purple. There are compact forms that are useful for edging the border. Height, 1 to 1½ feet.

**\**Viola hybrida***. Bedding Viola. This is a perennial but will bloom in summer if seed is sown indoors. The plants are compact and bear many flowers that will continue to bloom until severe frost if the faded ones are removed. Violas are useful for planting in front of a perennial border in places where the early bulbs have died down. When the plants become overgrown and untidy the tops should be cut off and new growth will start from the root. There are a great number of varieties in shades of yellow, blue, and purple as well as white. The flowers are each of a single color and smaller than many pansies. Height, 6 to 8 inches.

**\**V. tricolor***. Pansy. To get the best results from pansies the seed should be sown in cold frames in July and transplanted into rich soil when the seedlings are large enough to handle. If planted in their permanent place in the fall in mild districts or in May in cold ones they should flower well most of the summer. To have large flowers, rich soil and plenty of moisture are necessary. Height, 6 to 8 inches.

***Viscaria***. See *Lychnis*.

***Xeranthemum annuum***. Immortelle. Attractive plants which bloom for a long period and look good when massed in a bed. They are very useful for winter bouquets.

**\**Zinnia elegans***. Zinnia. This is said to be the species from which the modern horticultural zinnias have been derived. There are a number of classes which vary in size from dwarf plants with blooms 1 inch across to tall bushes with blooms 4 to 5 inches in diameter. All colors seem to be available except blue. They are very attractive in the garden and are useful as cut flowers for decorating the home. They grow best in full sun but will bloom in partial shade. Height, 6 inches to 4 feet.

***Z. linearis***. A single-flowering species which is useful for edging borders or for the rock garden. The blooms are orange with a broad, maroon zone at the base of the rays. They have a spreading habit and should be planted about a foot apart. Height, 8 to 10 inches.

## ORNAMENTAL GRASSES

There are a number of grasses with attractive flowering spikes which are useful when dried for adding to winter bouquets. The spikes should be gathered before the pollen begins to shed and hung up to dry in an airy place. The seed can be started indoors or sown outside. The following kinds have done well at the Central Experimental Farm, Ottawa:

*Agrostis nebulosa*. Cloud Grass. Height, 1 foot.

*Briza maxima*. Great Quaking Grass. Height, 1 foot.

*Eragrostis tenella*. Love Grass. Height, 1 to 2 feet.

*Lagurus ovatus*. Hare's-tail Grass. Height, 1 foot.

*Pennisetum ruppelii*. Purple Fountain Grass. Height, 2 to 3 feet.

*Pennisetum villosum* (*P. longistylum*). Feathertop. Height, 2 to 3 feet.

*Tricholaena rosea*. Ruby Grass. Height, 2 to 3 feet.



## ANNUALS FOR SPECIAL PURPOSES

### For Colorful Beds and Borders

The following varieties selected by A. R. Buckley, Plant Research Institute, have performed well to this date (1966) at the Central Experimental Farm, Ottawa.

*Ageratum*: Blue Mink, Blue Blazer, Violet Cloud

*Alyssum*: Carpet of Snow, Royal Carpet, Navy Blue, Rosie O'Day

*Antirrhinum*:

Dwarf—Floral Carpet strain in separate colors or mixed

Medium—Carioca blend, Knee-high strain, Sprite strain

Tall—Rocket strain in separate colors or mixed

Novelty snapdragon—Bright Butterflies in mixed colors

*Begonia* (Fibrous-rooted type):

Low (6—8 inches)—Dwarf Carmen, Dwarf Indian Maid, Flamingo, Galaxy, Rose Wonder, Zurich

Tall (12—15 inches)—Carmen, Cinderella strain, Indian Maid, Scandinavia strain, Tausendschon strain

*Callistephus* (China Aster): These are excellent bedding types of asters.

Low—Best-of-all strain, Dwarf Queen strain, Kirkwell strain

Intermediate—Bouquet, Duchess, Geisha and Princess types

Tall—Ball, Lady, and Peony types and Perfection strain

*Celosia* (Cristata or comb type):

Tall—Fireglow, Toreador

Dwarf—Coral Garden, Empress and Kardinal strains

(Plumed type):

Tall—Forest Fire, Golden Fleece

Short—Fiery Feather

*Cosmos*: Sunset and Sensation strain

*Dahlia* (from seed): Early Bird mixture (Dwarf, 18—24 inches)

*Dianthus*: Baby Doll, Bravo, Westwood Beauty

*Geranium* (from seed): Nittany Lion

*Impatiens*: Jewel series, Imp series

*Lobelia*: Blue Gown, Cambridge Blue, Mrs. Clibran Improved

*Marigold*:

Low, double—Sparky, Spun Gold, Spun Yellow, Yellow Nugget

Low, single—Naughty Marietta

Tall—Climax series, Gold Coin series, Diamond Jubilee

*Pansy*: Majestic strain in mixture, Majestic White-with-blotch, Floradale

*Petunia*: Multiflora single—Blue Mist, Coral Satin, Paleface, Pink Bountiful, Pinwheel, Red Cap, Snowdrift

Multiflora double—Cherry Tart, Honey Bunch, Pink Riches, Plum Double, Strawberry Tart

Grandiflora single—Appleblossom, Bingo Improved, Capri, Cascade series, Coral Magic, Dreamland, Pink Cameo, Sunburst, Touché, White Magic

Grandiflora double—Blue Monarch, Dorothy Favorite, Salmon Delia, White Swan

*Phlox*:

Red—Cinnabar Red, Tetra Red

Salmon—Glamour

Blue-red—Fireball

Blue—Sky Blue  
 Cream—Isabellina  
 White—Snowball  
 Novelty type—Twinkle mixed or in separate colors  
 Mixtures—Cecily mixed, Grandiflora mixed, Globe mixed

*Salvia:*

Medium dwarf—

Scarlet: Blaze of Fire, Piccolo, Red Pillar, Flarepath, Hot Jazz

Other colors: Evening Glow, Pink Rouge, Burgundy, Violet Flame

Very dwarf—Salmon Queen

Farinaceae—Royal Blue, Royal White

Horminum—Pink Sundae

*Verbena:*

Spreading—

Blue: Amethyst

Pink: Miss Susie, Ellen Willmott

Red: Sparkle

Tall—Giant Salmon Queen, Spectrum red

*Zinnia:*

Giant Cactus-flowered—Bonanza, Firecracker, Poly Pink, Princess,  
 Red Man, Sun God, Yellow Zenith

Giant—State Fair series

Small-flowered—Gem series, Red Buttons, Pink Buttons

Novelty types—

Mexican: Halo, Old Mexico

Green: Envy

Scabious-flowered

Persian Carpet

**Climbers**

Adlumia

Dolichos

Lagenaria

Cobaea

Echinocystis

Lathyrus

Cucurbita

Ipomoea

Tropaeolum

**Cut Flowers**

Antirrhinum

Delphinium

Phlox drummondii

Brachycome

Dianthus

Polygonum

Browallia

Didiscus

Reseda

Calendula

Dimorphotheca

Rudbeckia

Callistephus

Gaillardia

Salpiglossis

Celosia

Gypsophila

Scabiosa

Centaurea

Helianthus

Schizanthus

Chenopodium

Lathyrus

Tagetes

Chrysanthemum

Lavatera

Tropaeolum

Coreopsis

Mathiola

Verbena

Cosmos

Nemesia

Viola

Dahlia

Papaver

Zinnia

**Fragrance**

Centaurea moschata	Lobularia	Petunia
Chenopodium botrys	Mathiola annua	Reseda
Heliotropium	Mathiola bicornis	Verbena
Lathyrus	Nicotiana alata	

**Foliage**

Amaranthus	Centaurea gymnocarpa	Kochia
Artemisia	Chrysanthemum	Ricinus

**Everlasting Flowers for Winter Bouquets**

Ammobium	Helichrysum	Limonium
Gomphrena	Helipterum	Xeranthemum

**For Rock Gardens**

Antirrhinum Rock Hybrids	Iberis	Nemophila
Dimorphotheca	Ionopsidium	Nierembergia
Eschscholzia	Linaria	Portulaca
Gilia	Lobularia	Sanvitalia

**For Window Boxes**

Antirrhinum, Dwarf	Lobularia	Tropaeolum
Centaurea cineraria	Petunia	Verbena
Centaurea gymnocarpa	Phlox drummondii	Viola
Lobelia	Reseda	Zinnia Pompon

**Hedges**

Artemisia	Kochia	Ricinus
Cosmos	Lavatera	Tagetes—Tall
Helianthus	Polygonum	

**Annuals that Will Flower in Partial Shade**

Celosia	Ionopsidium	Oenothera drummondii
Clarkia	Lobelia	Petunia
Cleome	Lobularia	Phacelia
Coreopsis	Malcomia	Phlox drummondii
Delphinium	Mirabilis	Polygonum
Godetia	Nemophila	Verbena
Iberis	Nicotiana	Viola



### Annuals Especially Adapted to Hot Sandy Soil and Full Sunshine

Ageratum	Dimorphotheca	*Petunia
Calendula	Eschscholzia	Portulaca
Centaurea	*Marigold (Tagetes)	Zinnia

### Annuals that Do Well in Sand when they Receive Enough Moisture, but Prefer Heavier Soil and Less Direct Sun

**Antirrhinum	**Lobularia (Alyssum)	**Salvia
*Calistephus (Aster)	Nicotiana	**Scabiosa
Clarkia	Lobelia	Stocks
Cosmos	Nemesia	*Verbena
Larkspur	**Phlox	

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\* Will stand light frost, 28° to 30° F., without damage.

\*\* Will stand frost down to 25° F.

## COMMON AND BOTANICAL NAMES, AND SOWING CLASSES OF ANNUALS

COMMON NAME	BOTANICAL NAME	*SOWING CLASS
African Daisy, Blue-eyed.....	<i>Arctotis</i> .....	b
African Daisy, Golden.....	<i>Dimorphotheca</i> .....	b
African Marigold.....	<i>Tagetes</i> .....	b
Alkanet.....	<i>Anchusa</i> .....	c
Allegheny Vine.....	<i>Adlumia</i> .....	b
Alyssum, Sweet.....	<i>Lobularia</i> .....	a
Amaranth, Globe.....	<i>Gomphrena</i> .....	b
Ambrosia.....	<i>Chenopodium</i> .....	c
Aster.....	<i>Callistephus</i> .....	c
Aster, Chinese.....	<i>Callistephus</i> .....	c
Baby Blue-eyes.....	<i>Nemophila</i> .....	b
Babies'-breath.....	<i>Gypsophila</i> .....	a
Bachelors'-button.....	<i>Centaurea</i> .....	b
Balsam.....	<i>Impatiens</i> .....	b
Bartonia.....	<i>Mentzelia</i> .....	b
Bean, Hyacinth.....	<i>Dolichos</i> .....	a
Bellflower.....	<i>Campanula</i> .....	c
Belvedere.....	<i>Kochia</i> .....	b
Blue-eyed African Daisy.....	<i>Arctotis</i> .....	b
Blue Lace-flower.....	<i>Trachymene</i> .....	c
Blue Stonecrop.....	<i>Sedum</i> .....	a
Blue Woodruff.....	<i>Asperula</i> .....	a
Bugloss.....	<i>Anchusa</i> .....	c
Bugloss, Viper's.....	<i>Echium</i> .....	b
Burning Bush.....	<i>Kochia</i> .....	b
Butterfly Flower.....	<i>Schizanthus</i> .....	a
California Poppy.....	<i>Eschscholzia</i> .....	a
Canary-bird Flower.....	<i>Tropaeolum</i> .....	a
Candytuft.....	<i>Iberis</i> .....	b
Cape Marigold.....	<i>Dimorphotheca</i> .....	b
Carnation.....	<i>Dianthus</i> .....	c
Castor-oil Plant.....	<i>Ricinus</i> .....	c
Catchfly, Sweet Wiliam.....	<i>Silene</i> .....	a
China Aster.....	<i>Callistephus</i> .....	c
Chinese Pink.....	<i>Dianthus</i> .....	c
Chinese Woolflower.....	<i>Celosia</i> .....	c
Cigar-flower.....	<i>Cuphea</i> .....	c
Clarkia.....	<i>Clarkia</i> .....	a

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\* See "Dates of Sowing", page 4.



COMMON NAME	BOTANICAL NAME	*SOWING CLASS
Climbing Fumitory.....	<i>Adlumia</i> .....	b
Climbing Nasturtium.....	<i>Tropaeolum</i> .....	a
Cockscomb.....	<i>Celosia</i> .....	c
Coneflower.....	<i>Rudbeckia</i> .....	a
Cornflower.....	<i>Centaurea</i> .....	a
Corn Marigold.....	<i>Chrysanthemum</i> .....	b
Cucumber, Wild.....	<i>Echinocystis</i> .....	x
Cup-and-saucer Vine.....	<i>Cobaea</i> .....	c
Cupflower.....	<i>Nierembergia</i> .....	d
Cypress, Summer.....	<i>Kochia</i> .....	b
Daisy, African.....	<i>Dimorphotheca</i> .....	b
Daisy, Swan River.....	<i>Brachycome</i> .....	b
Diamondflower.....	<i>Ionopsidium</i> .....	a
Dusty Miller.....	<i>Centaurea</i> .....	b
Fairy Bouquet.....	<i>Linaria</i> .....	b
Evening Primrose.....	<i>Oenothera</i> .....	c
Feverfew.....	<i>Chrysanthemum</i> .....	b
Flax, Scarlet.....	<i>Linum</i> .....	a
Flossflower.....	<i>Ageratum</i> .....	d
Fountain Plant.....	<i>Amaranthus</i> .....	c
Four-o'clock.....	<i>Mirabilis</i> .....	b
Fumitory, Climbing.....	<i>Adlumia</i> .....	b
Garden Balsam.....	<i>Impatiens</i> .....	b
Globe Amaranth.....	<i>Gomphrena</i> .....	b
Gourd.....	<i>Cucurbita, Lagenaria</i> .....	x
Heliotrope.....	<i>Heliotropium</i> .....	d
Hollyhock, Indian Spring.....	<i>Althaea</i> .....	c
Hyacinth Bean.....	<i>Dolichos</i> .....	a
Immortelle.....	<i>Ammobium</i> .....	b
Indian Pinks.....	<i>Dianthus</i> .....	c
Jewel-of-the-Veld.....	<i>Ursinia</i> .....	c
Larkspur.....	<i>Delphinium</i> .....	c
Love-in-a-mist.....	<i>Nigella</i> .....	b
Love-lies-bleeding.....	<i>Amaranthus</i> .....	c
Mallow.....	<i>Malope</i> .....	b
Marigold, African.....	<i>Tagetes</i> .....	b
Marigold, Cape.....	<i>Dimorphotheca</i> .....	b
Marigold, Corn.....	<i>Chrysanthemum</i> .....	b
Marigold, French.....	<i>Tagetes</i> .....	b
Marigold, Pot.....	<i>Calendula</i> .....	b
Marvel-of-Peru.....	<i>Mirabilis</i> .....	d
Mignonette.....	<i>Reseda</i> .....	a
Morning Glory Vine.....	<i>Ipomoea</i> .....	b
Mountain Fringe.....	<i>Adlumia</i> .....	b
Nasturtium.....	<i>Tropaeolum</i> .....	a

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x Sow in ground previous October.

COMMON NAME	BOTANICAL NAME	*SOWING CLASS
Night-scented Stock.....	<i>Mathiola</i> .....	c
Pansy.....	<i>Viola</i> .....	d
Pea, Sweet.....	<i>Lathyrus</i> .....	b
Petunia.....	<i>Petunia</i> .....	d
Phlox, Annual.....	<i>Phlox Drummondii</i> .....	b
Pincushion Flower.....	<i>Scabiosa</i> .....	b
Pink, Chinese.....	<i>Dianthus</i> .....	c
Pink, Indian.....	<i>Dianthus</i> .....	c
Poppy, California.....	<i>Eschscholzia</i> .....	a
Poppy, Corn.....	<i>Papaver</i> .....	b
Poppy, Shirley.....	<i>Papaver</i> .....	x
Pot Marigold.....	<i>Calendula</i> .....	b
Primrose, Evening.....	<i>Oenothera</i> .....	c
Prince's-feather.....	<i>Amaranthus</i> .....	c
Purple Ragwort.....	<i>Senecio</i> .....	c
Ragwort, Purple.....	<i>Senecio</i> .....	c
Rose Moss.....	<i>Portulaca</i> .....	a
Sage.....	<i>Salvia</i> .....	d
Scarlet Flax.....	<i>Linum</i> .....	a
Siberian Wallflower.....	<i>Cheiranthus</i> .....	d
Snapdragon.....	<i>Antirrhinum</i> .....	c
Spiderflower.....	<i>Cleome</i> .....	b
Statice.....	<i>Limonium</i> .....	c
Stock.....	<i>Mathiola</i> .....	c
Stock, Night-scented.....	<i>Mathiola</i> .....	c
Stock, Ten-weeks.....	<i>Mathiola</i> .....	c
Stock, Virginian.....	<i>Malcomia</i> .....	a
Stonecrop, Blue.....	<i>Sedum</i> .....	a
Strawflower.....	<i>Helichrysum</i> .....	b
Sultan, Sweet.....	<i>Centaurea</i> .....	b
Summer Cypress.....	<i>Kochia</i> .....	b
Summer Fir.....	<i>Artemisia</i> .....	c
Sundrop.....	<i>Oenothera</i> .....	c
Sunflower.....	<i>Helianthus</i> .....	a
Swan River Daisy.....	<i>Brachycome</i> .....	b
Sweet Alyssum.....	<i>Lobularia</i> .....	a
Sweet Pea.....	<i>Lathyrus</i> .....	b
Sweet Scabious.....	<i>Scabiosa</i> .....	b
Sweet Sultan.....	<i>Centaurea</i> .....	b
Sweet William.....	<i>Dianthus</i> .....	c
Sweet William Catchfly.....	<i>Silene</i> .....	a
Sweet Wivelsfield.....	<i>Dianthus</i> .....	c
Ten-weeks Stock.....	<i>Mathiola</i> .....	c
Tickseed.....	<i>Coreopsis</i> .....	a
Toadflax.....	<i>Linaria</i> .....	b
Tobacco.....	<i>Nicotiana</i> .....	b

COMMON NAME	BOTANICAL NAME	*SOWING CLASS
Verbena.....	<i>Verbena</i> .....	c
Viper's Bugloss.....	<i>Echium</i> .....	b
Virginian Stock.....	<i>Malcomia</i> .....	a
Viscaria.....	<i>Lychnis</i> .....	b
Wallflower, Siberian.....	<i>Cheiranthus</i> .....	d
Wild Cucumber.....	<i>Echinocystis</i> .....	x
Winged Everlasting.....	<i>Ammobium</i> .....	b
Woodruff, Blue.....	<i>Asperula</i> .....	a
Woodflower.....	<i>Celosia</i> .....	c
Zinnia.....	<i>Zinnia</i> .....	a

## METRIC EQUIVALENTS

## LENGTH

inch = 2.54 cm	millimetre = 0.039 in.
foot = 0.3048 m	centimetre = 0.394 in.
yard = 0.914 m	decimetre = 3.937 in.
mile = 1.609 km	metre = 3.28 ft
	kilometre = 0.621 mile

## AREA

square inch = 6.452 cm <sup>2</sup>	cm <sup>2</sup> = 0.155 sq in.
square foot = 0.093 m <sup>2</sup>	m <sup>2</sup> = 1.196 sq yd
square yard = 0.836 m <sup>2</sup>	km <sup>2</sup> = 0.386 sq mile
square mile = 2.59 km <sup>2</sup>	ha = 2.471 ac
acre = 0.405 ha	

## VOLUME (DRY)

cubic inch = 16.387 cm <sup>3</sup>	cm <sup>3</sup> = 0.061 cu in.
cubic foot = 0.028 m <sup>3</sup>	m <sup>3</sup> = 31.338 cu ft
cubic yard = 0.765 m <sup>3</sup>	hectolitre = 2.8 bu
bushel = 36.368 litres	m <sup>3</sup> = 1.308 cu yd
board foot = 0.0024 m <sup>3</sup>	

## VOLUME (LIQUID)

fluid ounce (Imp) = 28.412 ml	litre = 35.2 fluid oz
pint = 0.568 litre	hectolitre = 26.418 gal
gallon = 4.546 litres	

## WEIGHT

ounce = 28.349 g	gram = 0.035 oz avdp
pound = 453.592 g	kilogram = 2.205 lb avdp
hundredweight (Imp) = 45.359 kg	tonne = 1.102 short ton
ton = 0.907 tonne	


## PROPORTION

1 gal/acre = 11.232 litres/ha	1 litre/ha = 14.24 fluid oz/acre
1 lb/acre = 1.120 kg/ha	1 kg/ha = 14.5 oz avdp/acre
1 lb/sq in. = 0.0702 kg/cm <sup>2</sup>	1 kg/cm <sup>2</sup> = 14.227 lb/sq in.
1 bu/acre = 0.898 hl/ha	1 hl/ha = 1.112 bu/acre





INFORMATION  
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IF UNDELIVERED, RETURN TO SENDER      EN CAS DE NON-LIVRAISON, RETOURNER À L'EXPÉDITEUR

